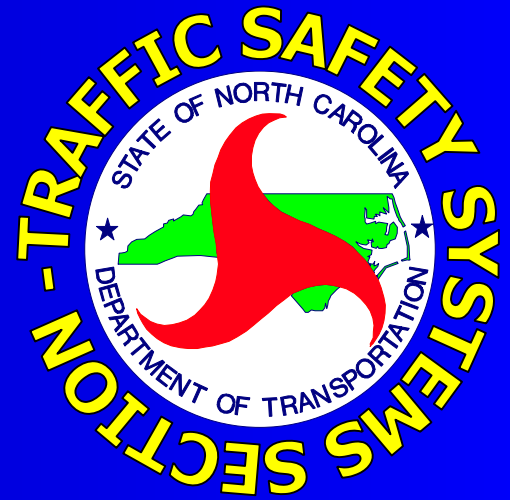


# TSSS



*Highway Safety  
Improvement  
Program Group*

# Highway Safety Improvement Program Group



## Purpose:

- Initiated in 1966 to reduce the number and severity of crashes, and to reduce the potential for crashes on all highways
- Provide a systematic procedure that identifies, reviews and addresses traffic safety concerns throughout the state.

# Highway Safety Improvement Program Group

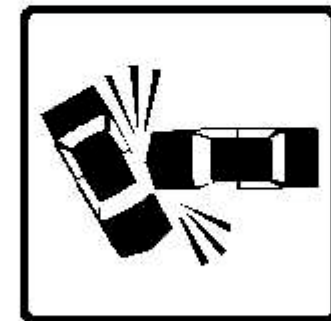
## Safety Warrants:

- Safety warrants are used to identify potentially hazardous (PH) locations that meet or exceed minimum criteria
- Criteria for safety warrants is based on multiple variables including crash frequency, severity, conditions, etc.
- PH Locations are prioritized by a weighting factor



North Carolina

### **HIGHWAY SAFETY IMPROVEMENT PROGRAM OPERATIONS MANUAL**



Traffic Safety Systems Management Unit  
Traffic Engineering and Safety Systems Branch  
North Carolina Department of Transportation



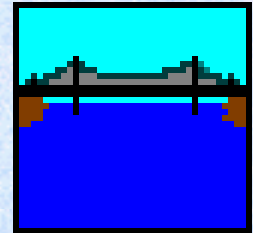
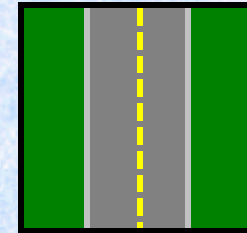
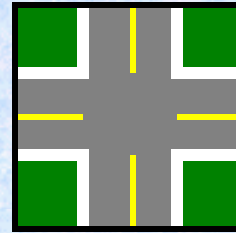


# Highway Safety Improvement Program Group

## 2005 SAFETY WARRANTS

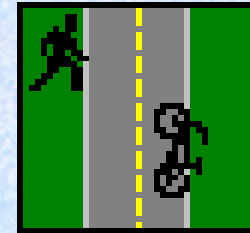
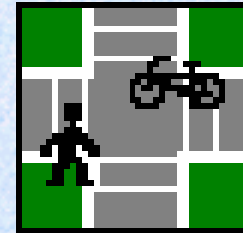
### Intersection Warrants:

- I-1: Frontal Impact
- I-2: Last Year Increase
- I-3: Frequency with a Severity Index Minimum
- I-4: Night Location without Streetlights
- I-5: Chronic Pattern (Rear End or Crossing)



### Section Warrants:

- S-1: Run Off Road during Wet Road Conditions
- S-2: Run Off Road
- S-3: Wet Road Condition
- S-4: Non-Intersection Night Location without Streetlights



### Bridge Warrant:

### Bicycle and Pedestrian Intersection/Section Warrants:

- Last 3 Years, Darkness with Streetlights, Alcohol Involvement and Chronic Locations

# Highway Safety Improvement Program Group

## Current HSIP (2005 Cycle):

- 2,563 potentially hazardous intersection locations
- 416 potentially hazardous section locations
- 187 potentially hazardous bridge locations
- 125 potentially hazardous bike/ped intersections
- 174 potentially hazardous bike/ped sections





# Highway Safety Improvement Program Group

## The HSIP Group's Role:

- Perform detailed studies of higher ranked or requested PH locations. This includes performing a detailed crash analysis, performing a warrant analysis, identifying major crash patterns, and developing collision diagrams and/or other additional supporting information necessary for field investigations.

The screenshot shows the 'TEAAS - Reports - Intersection Analysis' window. It features a menu bar with 'Edit' and 'Help', and a toolbar with various icons. The main interface is divided into several sections:

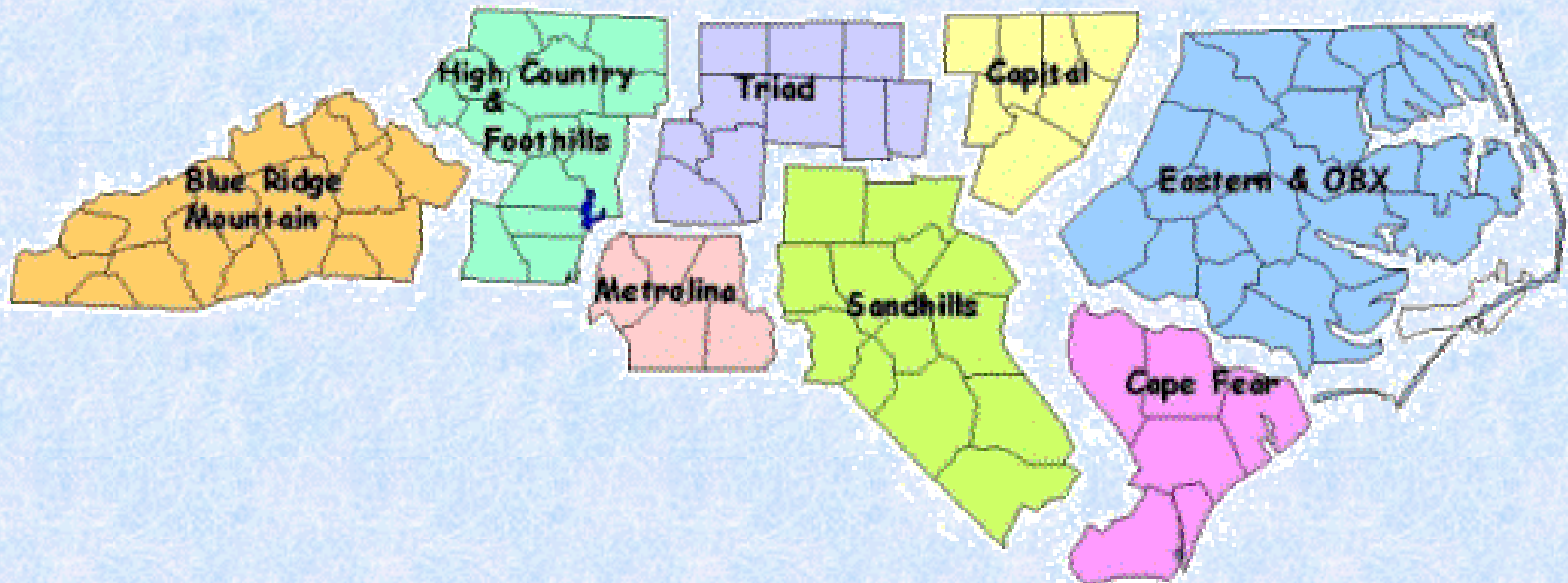
- Study Information:** Includes tabs for 'Road Identification' and 'Accident Adjustments'. A 'Save As' button is present.
- Study Area:** Contains fields for 'Study Name', 'Location Text', 'County', 'Division', 'Municipality', 'Y-Line Feet' (set to 150), 'Begin Date', 'End Date', 'Years', 'ADT', 'ADT Route', 'K/A Coeff.' (76.8), 'B/C Coeff.' (8.4), 'Log No.', 'PH No.', and 'TIP No.'.
- Request Information:** Includes fields for 'Received', 'Courier Service', 'Requested By', 'Phone', 'Phone Ext.', and 'Fax'.
- Last Update:** Includes fields for 'User ID' and 'Date/Time'.

At the bottom, there is a status bar showing '0 of 0' and navigation buttons.

# Highway Safety Improvement Program Group

## Regional Engineer's Role:

Review crash data, study existing roadway facility, observe traffic operations, identify possible countermeasures, assess and select best countermeasures (B:C ratio), determine funding sources and submit recommendations.



# Highway Safety Improvement Program Group

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## PH Location Examples

- PH# 15I00026 - NC 24 @ SR 1141 (Carteret Co.)
- PH# 96S00009 - SR 1143 near SR 1144 (Wilkes Co.)
- PH# 48B00019 - Bridge No. 3 on SR 2362 (Iredell Co.)







Approaching Intersection on Westbound NC 24





Approaching Intersection on Westbound NC 24

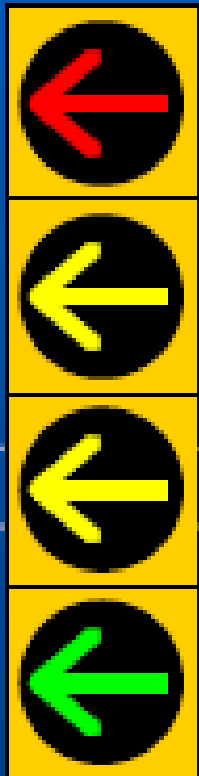




Stopped at Light on Eastbound NC 24

# Proposed 4-Section PPLT Display

- The researchers have proposed a new 4-section PPLT display:



**Solid Red Arrow:** Stop. No left turn allowed.

**Solid Yellow Arrow:** Prepare to stop.

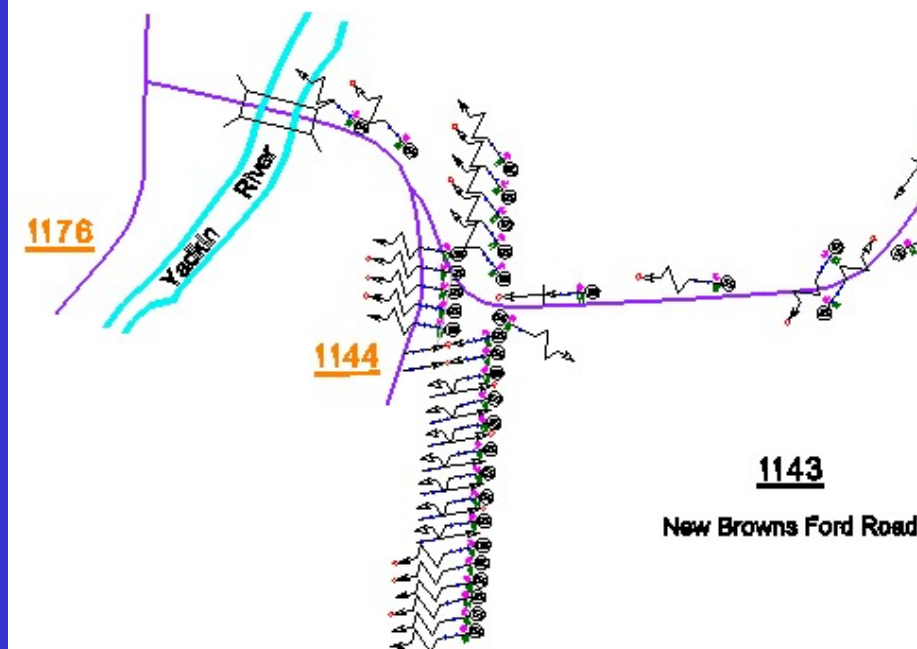
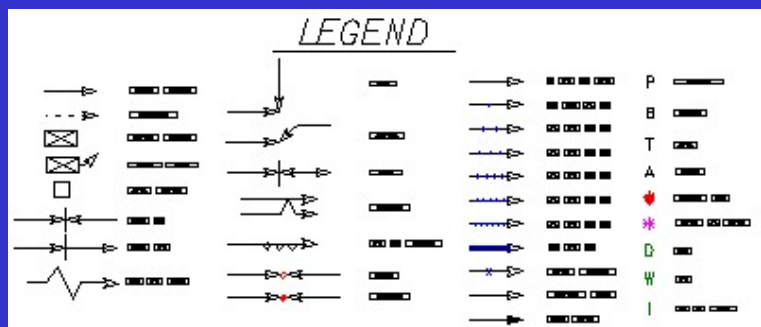
**Flashing Yellow Arrow:** Left turns allowed, but first yield to oncoming traffic & pedestrians.


**Solid Green Arrow:** Left turns allowed. Proceed with caution.

## 4-Section Flashing-Yellow Arrow Display







|   |  |                      |  |
|---|--|----------------------|--|
|    |  | COLLISION DIAGRAM    |  |
| DIVISION: I   |  | REGION: HIGH COUNTRY |  |
| STUDY PERIOD: 3/1/2000 TO 2/28/2005   |  |                      |  |
| DISTANCE: 0.99 MI. Y-LINE: 0 FT.  |  |                      |  |
| ANALYSIS PREPARED BY: SUSIE J. JAMES, PE  |  |                      |  |
| DIAGRAM PREPARED BY: SUSIE J. JAMES, PE   |  |                      |  |
| DIAGRAM REVIEWED BY: SUSIE J. JAMES, PE   |  |                      |  |
| FH NUMBER: 96500008   |  |                      |  |
| SCALE: NOT TO SCALE   |  |                      |  |
| DATE: 8/9/2005  |  |                      |  |
| LOC NUMBER: 200504076   |  |                      |  |
| PAGE: 10 F 1  |  |                      |  |
| <b>N.C. DEPARTMENT of TRANSPORTATION</b><br><b>DIVISION of HIGHWAYS</b><br><b>TRAFFIC ENGINEERING AND SAFETY</b><br><b>SYSTEMS BRANCH</b> |  |                      |  |



Approaching Curve on Southbound SR 1143



Approaching Curve on Southbound SR 1143





Entering Curve on Southbound SR 1143



Southbound view of SR 1143 from Private Drive  
near Embankment



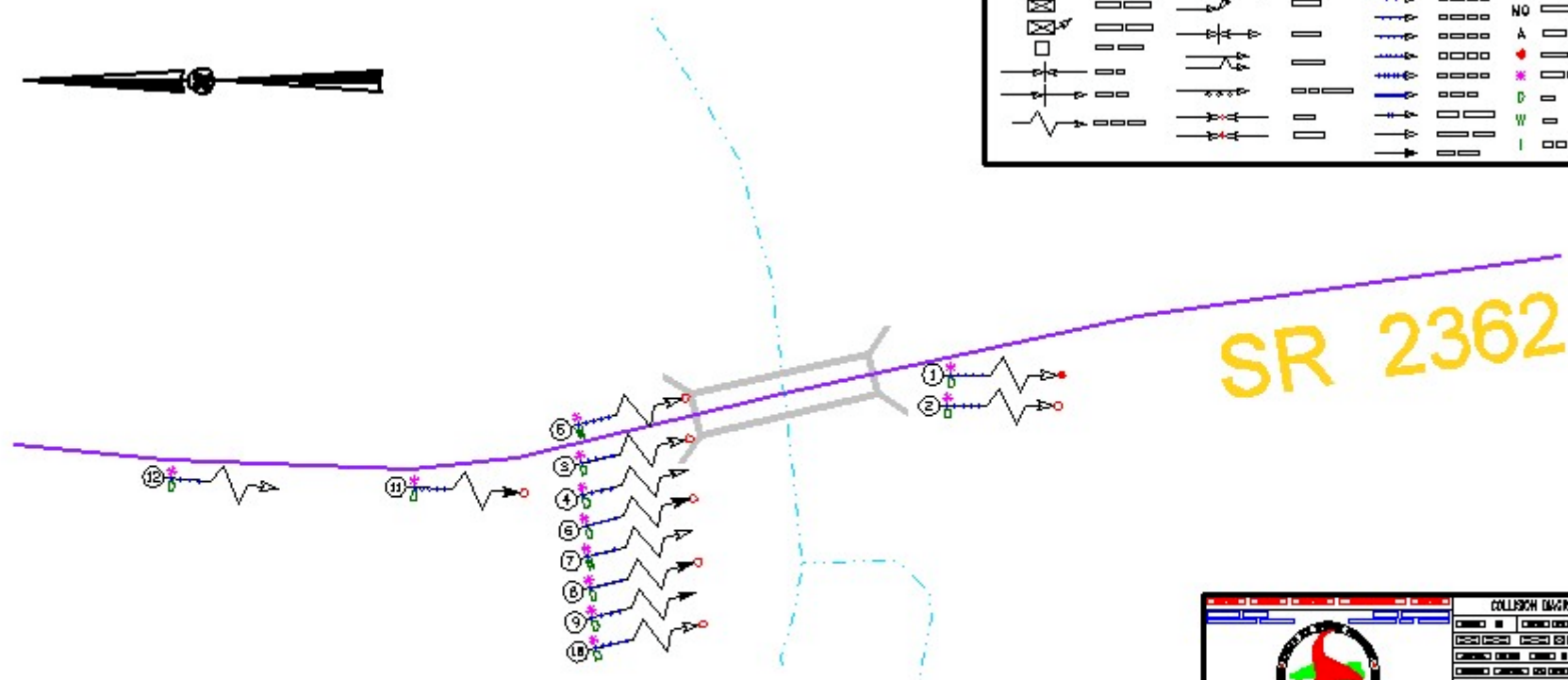
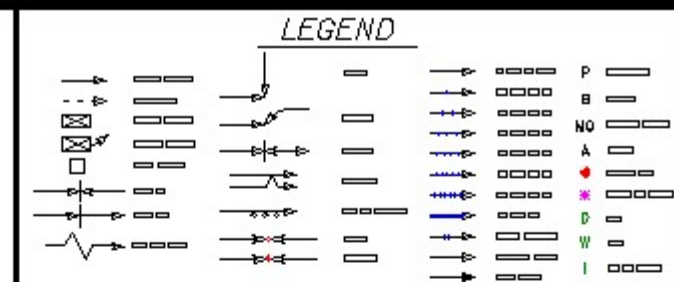


Southbound SR 1143 along Embankment





Southbound SR 1143 Exiting Curve



SR 2562, Bridge #490003  
Iradol County

**N.C. DEPARTMENT of TRANSPORTATION**  
**DIVISION of HIGHWAYS**  
**TRAFFIC ENGINEERING and SAFETY**  
**SYSTEMS BRANCH**



Southbound SR 2362 near Bridge



# Highway Safety Improvement Program Group



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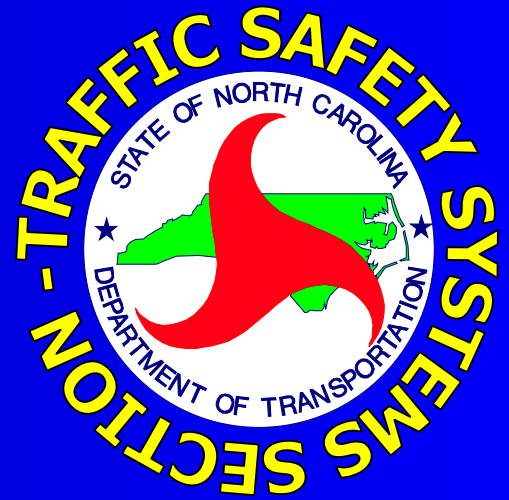


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# TSSS



*Questions?*